nary dissecting microscope, it was easy to inoculate new cultures. The gelatine was of the ordinary composition in daily use in the laboratory, viz.: ten per cent. gelatine, ten per cent. grape sugar, Liebig's "Fleisch Extract" added to give a yellowish brown color, and neutralized with sodium carbonate. Such a mixture is solid at 25° C.

For further culture the isolated gelatine plate colonies were inoculated into sterilized solutions consisting of an extract made by boiling 200 grams of yeast in a liter of water, filtering, and adding ten per cent. of grape sugar. In such a solution an inoculation of a few yeast cells usually increased in from twenty-four to forty-eight hours sufficiently to cover the sides and bottom of an ordinary 200 cc. flask with a thick white sediment. The cultures were most strong and active at the end of forty-eight hours. The supernatant fluid was then poured off, leaving the yeast deposit comparatively dry, twenty cc. of sterilized water added, and in this condition transfer to the sugar solution undergoing observation was easy, by means of a pipette. By this method, and the use of the extract of yeast as a nutritive solution, pure cultures were repeatedly obtained which excited as active fermentation as the fresh yeast from the breweries, a result not always obtained by the use of artificial nutritive solutions. The original gelatine plate cultures, on account of their rapid growth, were useless after thirty-six hours, and to avoid a constant renewal of the process, as well as the introduction of different species of saccharomycetes, inoculations were made into gelatine tubes. The cultures thus obtained produced characteristic, elegant, ivory-white colonies of 3-6 mm. in diameter, and then further development ceased. In this state they retained their vitality, and were constantly referred to as a source of inoculating material for two months. Probably they remained vigorous much longer, as saccharomycetes are well known to do, but at this time my need of them came to an end.

Such a dormant vegetative state might be favorable to the production of spores, which, according to the prescribed methods, I have had difficulty in obtaining. At least, for the object desired, the method given was found very convenient and successful.—W. E. STONE, *Göttingen.*

The preparation of agarics for the herbarium.—It will be generally admitted that the wretched condition of most specimens of fleshy fungi in herbaria and published exsiccatæ makes them practically worthless for purposes of comparison and identification. The purpose of this note is to call attention to a practicable process for greatly improving the quality of such specimens and so rendering them really valuable.

In 1880, G. Herpell, of St. Goar, Germany, published an account[1] of his method for the preparation of herbarium specimens of fleshy fungi, and from 1881 to 1884 issued illustrations of his method in the form of four small fascicles of Agaricini, under the title, "*Sammlung präparirter Hut-*

[1]Das Präpariren und Einlegen der Hutpilze. Bonn, 1880.

pilze," certainly by far the finest exsiccatæ of this group ever distributed. A partial translation of his article was given by W. R. Gerard, in the *Bull. Torrey Bot. Club* for March and May, 1881.

The writer has succeeded in simplifying Herpell's process without much sacrifice of efficiency, and offers the following abstract of the method, as modified: The whole fungus is split vertically with a sharp knife into halves. From one half a thin slice is taken by a careful cut parallel to the first, and laid aside as No. 1. From the other half the stipe is cut off close to the pileus, and gills and flesh are removed as completely as possible from both pileus and stipe, so as to leave only their outer surfaces intact. These shells of pileus and stipe are Nos. 2 and 3, respectively.

The three preparations thus made are now laid, right side up, on a prepared adhesive paper, covered with unsized muslin, and placed between driers of heavy felt paper, under a moderate pressure.

Great care should be taken not to destroy any delicate portions of veil or volva which may be present in making the various preparations, which should show (1) attachment of gills and nature of interior of stipe, (2) nature of top of pileus, (3) nature of surface of stipe and presence or absence and nature of veil and volva. Either of the adhesive papers in use for strapping plants to the herbarium sheet serves excellently for this purpose, viz.: Dennison's gummed paper or photographers' albumen paper. The latter, perhaps, gives rather better results. Driers should be frequently changed, and pressure should be secured by *weights*, not by screws. When the specimens are partly dried the muslin may be carefully removed; and when wholly dried they will be found to be firmly attached to the paper, their adhesion to which has prevented the shrinking so prominent in the common method of drying these fungi.

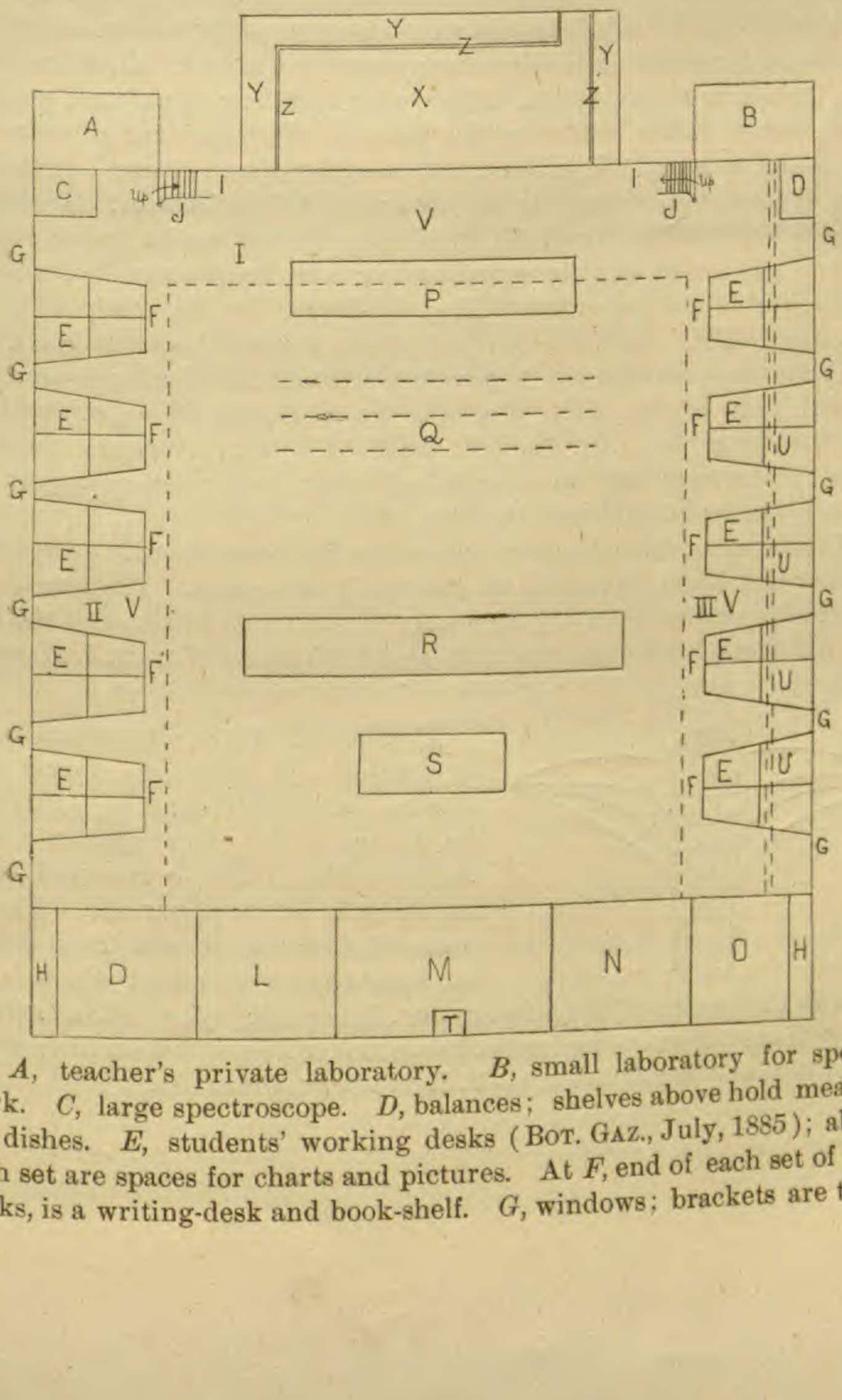
The paper is now to be cut away with knife or scissors close to the edge of each preparation, which is then ready for mounting. No. 1 is first glued to the mounting paper; then No. 3; lastly No. 2 is put on, overlapping No. 3 in such a way that the two together give a profile view of the living fungus.

Spore preparations made in the usual way on adhesive paper are permanent, since almost any pileus has sufficient moisure to soften the gum or albumen, which dries when the pileus is removed and holds the spores fast. This can then be mounted with the other preparation to complete the specimen.

Many little points will suggest themselves in carrying the process through, but the above is an outline of its essential features. It does not wholly obviate the necessity for colored drawings of the fresh fungus, but renders them less indispensable and makes the preparation alone really useful. The time required to make a good specimen is, of course, much longer than is needed to dry and press an agaric in the old way, but is less than that required for a good specimen of a flowering plant, and the

difference in time consumed by the two processes is not at all commensurate with the difference in value of the results.—JAS. E. HUMPHREY, *Bloomington, Ind.*

Plan for botanical laboratory.—The BOTANICAL GAZETTE for July, 1885, published an outline course in plant chemistry. A laboratory desk arranged for such work was figured in the same journal for the following November.. It is believed that the laboratory sketched below will be found convenient for the study of plant anatomy as well as of plant chemistry.



A, teacher's private laboratory. *B*, small laboratory for special work. *C*, large spectroscope. *D*, balances; shelves above hold measuring dishes. *E*, students' working desks (BOT. GAZ., July, 1885); above each set are spaces for charts and pictures. At *F*, end of each set of four desks, is a writing-desk and book-shelf. *G*, windows; brackets are to be